

CLAIMS

We claim:

1. A hub with clutch comprising, a hub body including a first sleeve that includes a means for mounting a driven gear thereon, and a second sleeve that includes means for arrangement as a wheel hub; a hub clutch arranged between said first and second sleeves including of a ring section fitted onto an end of said first sleeve and includes identical spaced pockets formed at equal spaced intervals around and into said ring section outer surface, with each said pocket including a deep forward section formed to accommodate a ball bearing fitted therein and each said pocket includes an outwardly sloping surface extending from said forward section to, or near to, said ring section surface, and an end of said second sleeve includes an 5 annular ring section that is adjacent to a cavity wherein said ring section is fitted such that, when said hub is assembled, said spaced pockets oppose an outer surface of said annular ring section, and including ball bearings contained in said pockets to roll from said pocket along said pocket outwardly sloping surface to engage and bind against said annular ring section surface, and with 10 said first and second sleeves including center passages that align to receive bearings for fitting therein that receive an axle fitted through center openings of said bearings; and a straight axle for fitting through said bearings center openings and including coupling means for fitting onto ends 15 of said straight axle for mounting to a frame.

2. The hub with clutch as recited in claim 1, further including a thrust bearing for 20 installation on the axle between the first and second sleeves that has a disk shaped body that is open through its center to receive said axle, which said body is formed from a pair of like flat disks that each have spaced radial slots formed therein that are aligned to receive needle bearings journaled therein, and including means for maintaining said pair of like flat disks together.

3. The hub with clutch as recited in claim 2, wherein the thrust bearing is fitted into a cavity formed in the ring section around the center passage formed therethrough, and is sandwiched between the bearings that are fitted, respectively, in the first and second sleeve abutting ends.

5 4. The hub with clutch as recited in claim 1, wherein the spaced pockets are identical and each has a cup shape, with said pocket opening to an upwardly sloping surface that extends oppositely to the direction of the ring section when the wheel is rolling forward; and the annular ring section outer surface includes steps formed at spaced intervals therearound for capturing a ball bearing surface as has traveled along the pocket outwardly sloping surface.

10 5. The hub with clutch as recited in claim 1, further including bearings formed to receive the axle fitted therethrough that each include an outer race of a diameter to fit in cavities formed in the first and second sleeves ends.

6. The hub with clutch as recited in claim 1, wherein the first sleeve includes as the means for mounting a driven gear thereon, a plurality of spaced raised longitudinal sections formed around the first sleeve exterior surface that receive a center opening of each gear to allow each said gear to slide over said spaced raised sections and lock thereon.

15 7. A hub with clutch comprising, a hub body including a first sleeve that includes a means for mounting a driven gear thereon, and a second sleeve that includes means for arrangement as a wheel hub; a hub clutch arranged between said first and second sleeves including of a ring section fitted onto an end of said first sleeve and includes identical spaced pockets formed at equal intervals around and into said ring section outer surface, with each said pocket including a forward section formed to have a size and shape to accommodate a ball bearing fitted therein and each said pocket includes an outwardly sloping trough type surface

extending from said forward section to, or near to, said ring section surface, and an end of said second sleeve includes an annular ring section located adjacent to a cavity wherein said ring section is fitted such that, when said hub is assembled, said spaced pockets oppose an outer surface of said annular ring section that includes means for providing a friction surface thereto whereby ball bearings contained in said pockets can roll along said pocket outwardly sloping trough type surface to engage said annular ring section friction surface, and said first and second sleeves include center passages that align to receive bearings fitted therein that receive an axle fitted through center openings that are formed through said bearings; and a straight axle for fitting through said bearings center openings and including coupling means for fitting onto ends 10 of said straight axle for mounting to a frame.

8. The hub with clutch as recited in claim 7, further including a thrust bearing for installation on the axle between the first and second sleeves that has a disk shaped body that is open through its center to receive said axle, which said body is formed from a pair of like flat disks that each have spaced radial slots formed therein that are aligned to receive needle bearings 15 journaled therein, and including means for maintaining said pair of like flat disks together.

9. The hub with clutch as recited in claim 8, wherein the thrust bearing is fitted into a cavity formed in the ring section around the center passage formed therethrough, and is sandwiched between the bearings that are fitted, respectively in the first and second sleeve abutting ends.

20 10. The hub with clutch as recited in claim 7, wherein the spaced pockets are identical and each has a cup shape, with said pocket opening to and upwardly sloping surface that extends oppositely to the direction of the ring section turning when the wheel is rolling forward; and the annular ring section other surface includes steps formed at spaced interval therearound as the

friction surface for capturing a ball bearing surface as has traveled along the pocket outwardly sloping surface.

11. The hub with clutch as recited in claim 7, further including bearings formed to receive the axle fitted therethrough that each include an outer race of a diameter to fit in cavities 5 formed in the first and second sleeves ends.

12. The hub with clutch as recited in claim 7, wherein the first sleeve includes a plurality of spaced raised sections formed as spaced longitudinal sections formed around the first sleeve exterior surface that are to receive one or more gears, each having a center opening to slide over said spaced raised sections, each said gear and lock thereon.

10 13. A hub with clutch comprising, a hub including a first sleeve that includes a means for mounting a driven gear thereon, and a second sleeve that includes means for arrangement as a wheel hub; a hub clutch arranged between said first and second sleeves including a ring section fitted onto an end of said first sleeve and includes identical spaced pockets formed at equal spaced intervals around and into said ring section outer surface, with each said pocket including 15 a deep forward section formed to accommodate a ball bearing fitted therein and each said pocket includes an outwardly sloping surface extending from said forward section to, or near to, said ring section surface, and an end of said second sleeve includes an annular ring section adjacent to a cavity wherein said ring section is fitted such that, when said hub is assembled, said spaced pockets oppose an outer surface of said annular ring section whereby ball bearings contained in 20 said pockets can roll along said pocket outwardly sloping surface and engage, to bind against, said annular ring section surface, and said first and second sleeves include center passages that align to receive bearings fitted therein that receive an axle fitted through center openings of said bearings; a bearing means fitted between said first and second sleeves for minimizing load forces

directed across said first and second sleeves; and a straight axle for fitting through said bearings center openings and includes coupling means for fitting onto ends of said straight axle for mounting to a frame.

14. The hub with clutch as recited in claim 13, wherein the bearing means fitted between 5 the first and second sleeves is a thrust bearing for installation on the axle between said first and second sleeves that has a disk shaped body that is open through its center to receive said axle, which said body is formed from a pair of like flat disks that each have spaced radial slots formed therein that are aligned to receive needle bearings journaled therein, and including means for maintaining said pair of like flat disks together.

10 15. The hub with clutch as recited in claim 14, wherein the thrust bearing is fitted into a cavity formed in the ring section around the center passage formed therethrough, and is sandwiched between the bearings that are fitted, respectively, in the first and second sleeve abutting ends.

16. The hub with clutch as recited in claim 13, wherein the spaced pockets are identical 15 and each has a cup shape, with said pocket opening to an upwardly sloping surface that extends oppositely to the direction of the ring section when the wheel is rolling forward; and the annular ring section outer surface includes steps formed at spaced intervals therearound for capturing the surface of a ball bearing as has traveled along the pocket outwardly sloping surface.

17. The hub with clutch as recited in claim 13, further including bearings formed to 20 receive the axle fitted therethrough that each include an outer race of a diameter to fit in cavities formed in the first and second sleeves ends.

18. The hub with clutch as recited in claim 13, wherein the first sleeve includes, as the means for mounting a driven gear thereon, a plurality of spaced raised sections formed as

longitudinal sections formed around the first sleeve exterior surface that are to receive a center opening formed through a gear or gears that are to slide over said spaced raised sections and lock thereon.